ENVIRONMENTAL SAMPLING PROJECT TASK FORCE

LAWRENCE BERKELEY NATIONAL LABORATORY

MEETING

MARCH 29, 2001

REPORTER'S TRANSCRIPT OF PROCEEDINGS
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A P P E A R A N C E S:

Meeting Facilitators: Patricia Duffy, Jeannie Gerstle, Sheryllyn Dougherty.

Task Force Members: Keith Matthews, Sue Markland Day, Pamela Evans, Paul Lavely, Pamela Sihvola, Michael Rochette, Evelyn Fisher, Fran Packard, David Miller.

Presenter: David McGraw.

PROCEEDINGS

MS. DUFFY: We'd like to welcome you to the Environmental Sampling Project Task Force meeting. And if everybody can calm down the conversation, please, we'd appreciate it. Thank you.

We'd like to start with the public comment period. Jeannie Gerstle will call six names and -- we only have two names. Okay. There is another card -- three, and...

MS. GERSTLE: We have only three cards.

MS. DUFFY: Eric, was that a yes? So we'll have a shorter public comment tonight.

For those who haven't been, it's a three minutes per speaker. And the green light -- you'll start with the green light. When the yellow light is on, it means you have a minute left, and then the red light is the end of your time. Thank you.

MS. GERSTLE: The first speaker is Elsie Blunt, L.A. Wood and then Jean Bernardi.

MS. BLUNT: Prevention, I am concerned about -- because I've seen too many things that have happened to too many people, and it was too late to do anything about them after the effect. So I wish you would think about it, because I have a child too, and there is other children that I'm definitely worried about. Thank you.

MS. DUFFY: Thank you. L.A..

MR. WOOD: Good evening, Task Force. My name is L.A. Wood. I'm sitting now on the Environmental Task Force, but that shouldn't change my opinion about this issue, nor am I speaking in that capacity tonight. I continue to speak of my own concerns.

Last time I was here at the Commission I kind of bad-mouthed some of the people sitting around the table who I feel to have been extremely inaccurate and inappropriate. Tonight I come to you wanting to salute at least one person on your Task Force who has actually started to take a lot of action, and I know she has in the past, but I wanted to acknowledge her tonight, and that's Pamela Evans of the Alameda County.

Because I know that she was working, along with myself and the Committee, to minimize toxic waste on campus as part of an impact grant, I was actually an active part of that outside Committee to Minimize Toxic Waste.

And we submitted an EMPACT grant. At the last minute we had to chase -- we weren't noticed soon enough. The process didn't wait up for us. But I know tonight Pamela Evans is sitting here having been truly baptized by this process. U.S. EPA is not the bad guys tonight. They basically came to us, I believe in Washington, in a very honest way, to offer us an opportunity for community

involvement, the kind that this isn't, quite obviously, you know.

And we have put forth a very coherent package with sponsorships and stuff. They have even drafted it up. The problem is when they sent it down here to be looked at, LBL said, "Hell, no, you can't come on to the property. We're not going to allow the community to come and participate. We're not going to allow them to do the kind of monitoring that they want down in the grove."

And also the University of California, people tend to forget who manages the Labs. They also said no. And I find that almost -- I wonder if it's intellectual arrogance that doesn't allow us to come forward, or is it just being absolutely blind to the fact that the community is out there.

I just mentioned that to Mr. Arens about how the Lab's mentality has always been to look toward Berkeley and not see a community and do anything that it wants. And I think that U.S. EPA put forth a very honest proposition, and to the discredit of the Lab and the University of California they didn't let us in, and I think it's a mark against what we tried to do the last four or five years. It's certainly a mark against the Task Force.

If you have a chance and opportunity to read what

we put forth you'll see a very, very comprehensive involvement. Instead, they prefer to do it themselves or find someone else. They prefer to go to the City of Berkeley and what I call the buy-out, a financial buy-out to get them to do some things and I think it's absolutely inappropriate.

What you should have been doing all along was trying to empower this community instead of manage it and stifle it, and this was your opportunity. You missed it.

And finally, I noticed that I've been videotaping a lot of these meetings, and I know people wondered, you know --

MS. GERSTLE: I'm sorry --

MR. WOOD: -- I'll just end it -- we only have two speakers. I just want to say that I've taped probably 250 hours of LBL over six or seven years. I'm going to make that available, some of that, onto the Web for the community, as a community resource so they can hear from the mouths of some of those people that represent DOE, U.S. EPA and others so they can hear the words of those people that they've spoken in the past because we need to remember where we've been.

And again, you missed the opportunity for community involvement, and you still have an outside -- as I said at the last meeting, there's nothing left to do but to rage.

MR. LAVELY: Before you go on, I want to say something. I represent the University of California, and I can tell you in my conversation with EPA we never said no. We never said no to the sampling. Because what you said wasn't correct.

I just want to tell you that you can -- I will give you phone numbers of the two people at the EPA, and you can ask them if we refused. If they told you that, I can tell you that is not what we said. We said we had some concerns about making sure that everyone had access to the information. We did not say that we would prevent anyone from coming onto the property to take samples.

MR. WOOD: I think that's under dispute, Mr. Lavely, and I would appreciate you not make a comment. It's inappropriate --

MR. LAVELY: There are lots of things that have been inappropriate --

MS. BERNARDI: Gene Bernardi, Committee to Minimize Toxic Waste.

I want to start by pointing out to you the attrition that's taken place here in the so-called community members present.

There were originally what I would consider four, possibly grass roots representatives here, only two neighborhood organizations and two environmental groups,

of which ours was one.

The representative to the other environmental group, COPE, has not been here for ages. He only attended a few meetings. The representative of the Panoramic Hill Association is not present. The labor representative never did come. Amy Kyle, that's -- she's not of a grass roots organization, but from the public, the U.C. School of Public Health has attended maybe one or two meetings.

So what do we have left here? We have seven regulators or people who work for LBNL or the Department of Energy or a consultant that's been hired by the Lab to -- well, I'd say counteract what's going on.

So I don't want to cast aspersions on the Alameda County Health Department or the League of Women Voters, but I don't consider them quite -- well -- one is an agency and the other I don't consider a grass roots organization because I think it's nationwide, and more power to them.

Now I'd like to talk about the sampling. To go out and to sample soil when the facility is not operating typically is a total waste of taxpayers' money. When you're sampling only within the first two feet, I want to make it clear that's what this sampling plan is suggesting.

If you were sampling when the facility was

operating typically, you wouldn't get the large amount of picocuries of tritium that are allowed by the EPA standards. It's something like 11 million picocuries per kilogram. So if you don't get it while it's operating typically, why go in and spend taxpayers' money to sample when it isn't operating typically. Why do it at all, because you're probably not going to find 11 million picocuries per kilogram in the soil.

Maybe if you went down a little deeper, you would. Because we've certainly found some, or the Lab has found some very high numbers in their lysimeter readings of ground water.

As far as sampling of air, why in the world are you going to use silica gel? Berndt Franke pointed out this is very inefficient. There are problems with it. And then you only go out once a month to check it. And yet these canisters fill up before the month is up, so obviously you're not going to get a complete reading of how much tritium there is.

And lastly, I'd like to say, you paid $25,000 for a wind tunnel study, and we would like Mr. Bruce White at U.C. Davis to come down at the next Task Force meeting and give a report on that, a full report, with a copy of his report to each and every member of the audience here.

MS. GERSTLE: Thank you. There is another card.

Barbara George?

MS. GEORGE: Good evening. It's still going on. You're still trying to have this phony tritium sampling, it looks like, and I just can't believe that it's still happening.

One of the things that we've been looking at lately is the fact that the Department of Toxic Substances Control said that you cannot do anything at the Tritium Labeling Facility since there is no place to put the waste, and the waste, quote, "treatability study" that you were using to get rid of the waste, it was shut down because of the accident.

So there is kind of a Catch-22 situation here. If you are operating the NTLF, then you're in violation of the stop order of the Department of Toxic Substances control. And if you're not operating the NTLF, there is nothing to monitor except what was there already in the past from all of the operations that have gone on over the years.

And we think it's outrageous that this is going on. We think it's high time for the regulators who are in the room to step up to do something about it.

And I understand the EPA was going to do a new project of putting a sampling monitor right down by the fence. There was a great big grant proposal to put this

together, and it looked like it was going to happen, with some good recent technology that would have given us a real-time reading of anything that was coming out, if there was anything coming out.

And lo and behold, the Lab killed that proposal. It's interesting because the Lab kills lots of proposals that would prove what's going on there and keeps trying to put this thing over on us, which is not going to show anything except how clever you guys are at not finding what's there.

I would like to remind everybody about Leticia Menchaca's work when she was working at the Lab, and she was finding high levels of tritium. And guess what? Next thing you know, there is no more funding for Dr. Leticia Menchaca. But there was funding for people to go through her files, to go through her desk for months after that, to try to find some dirt that could undermine her studies, which was never found. And so finally you had to admit that Leticia Menchaca's data was correct.

But I don't think people realize that not only was her data kept by the Lab and probably shredded, but her personal effects, all of her work on global warming which she had done in Mexico City was also kept by the Lab and not returned to her, except in a few pieces that were stained from being found in a wet shed. They'd been

molding out there for who knows how long, and there are only a few pieces left. We don't know what was lost.

Her whole life, her professional life was destroyed so that you guys could keep lying to the people of Berkeley.

MS. BLUNT: I'm sorry. I forgot something while I was up there, but I did read that it wasn't only people that were in the fields that were concerned. I did hear there were people only in the hills that were concerned, but I came to let you know I am concerned too. Because I do live downhill. And it rains -- when it rains on the hill folks, it rains on me down here too. And the water runs down. I live not far from Strawberry Creek, so it will affect me too.

MS. BERNARDI: I also have something.

MS. DUFFY: Just turn off the microphone, please Lynn. The time is up.

MS. BERNARDI: We ask for some information from the Lab, and that is what the schedule of tritiation will be for this year 2001. Because we understand they're going to start sampling and --

MS. DUFFY: I believe your representative's done that already. We have that information.

MS. BERNARDI: At the beginning of the discussion -- Pam Sihvola would like to talk about that, the fact

that we need that schedule of tritiation so we'll know --

MS. DUFFY: We would like to get going so we could begin the meeting, please.

MS. DOUGHERTY: Welcome to the ninth meeting of the Environmental Sampling Task Force, to you Task Force members, we would like to start the meeting out by drawing your attention to the agenda. You have an agenda in front of you.

We're going to start with agenda items number one and number two. And in a moment we're going to start with agenda item number three, which is entitled, "The Technical Basis for Siting Ambient Air Monitoring Stations at LBNL."

David McGraw, who is the member representing Berkeley Lab, is going to give a brief summary on the Task Force process to date, what's going on, and what's occurred since our last Task Force meeting.

David is then going to introduce Dr. Owen Hoffman, who is here to respond to the question of the technical basis for the siting of the ambient air monitors, as you received in your packets, the ones dated on 22 March, as I recall.

So on our January 17th meeting, I believe Pamela Sihvola did request a scientific justification for the placement of the ambient air monitoring stations. Pamela

was echoed by members Evelyn Fisher, Fran Packard, and Sue Markland Day. And all three remarked it would be useful to have such a scientific justification presented. So Dr. Owen Hoffman will be doing that presentation today.

And in your packets you will also find a copy of his report, which is entitled Technical Basis for Siting Additional Ambient Air Monitoring Stations for the Measurement of Tritiated Water Vapor at LBNL. It's in your packet of materials you received ahead of time.

We know you have a lot of paper. So we're trying to draw your attention to specifically what we're talking about tonight. We also have one special request before I introduce David McGraw to come up and speak before Dr. Hoffman joins us, and that is that Dr. Hoffman has made a special request of you, that you specifically hold your questions, if you will, on his presentation, until after he is complete.

If you have a pen and paper, there is all kinds of paper in front of you. If you could use the back of something and take notes, that would be greatly appreciated. Dr. Hoffman finds it extremely distracting and difficult to get through his presentations if there are interruptions. So we ask that you please be respectful of his attempt to answer your questions, and we could get through his presentation in the best possible

way.

We also have 40 minutes, you'll note on the agenda, to do Q and A with Dr. Hoffman after he makes his presentation. And furthermore, I would note that Owen has committed to any of you who have further questions beyond that time that's allowed on the agenda, that he will stay after the meeting as long as people have questions and continue to answer them.

So if we could do our best to be respectful of him as he's presenting, it would be greatly appreciated. In the meanwhile, David.

MR. MCGRAW: Just before I get started, to remind us where we are in the process, I want to say a few words about the EMPACT grant. We wrote a letter to EPA yesterday, and I only have one copy with me tonight, and I'd be happy to circulate it among all of the Task Force members.

But in the letter we say -- and this letter is a letter from me to Brian Littleton, who is in radiation protection or works in the Radiation Protection Division at EPA in Washington, D.C.

And it opens, "Mr. Littleton, this letter is to express Berkeley Lab's support for the EMPACT project concept described in your proposal to provide community access to information on radiation in the environment in

East Bay, Berkeley, California.

"We welcome the additional monitoring data that the EMPACT program proposes to provide and the new communication mechanism to provide that data openly to the public."

There is a couple other paragraphs in this letter, but that clearly states -- you haven't had time to catch up to things, L.A., so I'll share this letter with you. We're fully supportive of the grant. We had some concerns about the long term Q-A data, but we're willing to meet and discuss that, so --

MS. SIHVOLA: Can you read the portion that relates to the monitor --

MR. MCGRAW: You bet. How about I read the whole letter. All right? Why don't I just read the whole letter?

"This letter is to express Berkeley Lab's support for the EMPACT project concept described in your proposal to provide community access to information on radiation in the environment for the East Bay, Berkeley, California.

"Berkeley Lab's environmental monitoring program has provided data over the years that have demonstrated continuing compliance with DOE and EPA requirements for offsite radiation emissions. Reviews by DOE and EPA have confirmed these findings, and the data have been openly

communicated with public stakeholders.

"In addition, we've reduced tritium emissions and off-site emissions through systematic efforts over the past several years. We welcome the additional monitoring data that the EMPACT program proposes to provide and the new communication mechanisms to provide that data openly to the public.

"Our sole concern about the project proposal as presently structured lies in the administration of the project following the initial two-year project period in which EPA will be actively involved. In the long run it will be equally as important to maintain the high standards of data quality integrity as EPA will ensure during the initial two years.

"Yet the project proposal does not appear to provide mechanisms for ensuring that data quality integrity in the long run. We would be happy to work with you and with the other project participants to find a means to provide that assurance."

That is pretty open-ended, I think.

MS. SIHVOLA: So does it mean that the low-level monitor is back on the program?

MR. MCGRAW: Let's get on with the agenda.

MS. SIHVOLA: No, I would like to get an answer from you.

MR. MCGRAW: No, that's not on the agenda.

MS. SIHVOLA: Okay. That is something of why we are here.

MS. DUFFY: After the meeting we could take questions from the audience.

MR. MCGRAW: I would be happy to address those questions at the end. I'll stay with Owen.

MS. DUFFY: If we have interruptions we are never going to get to Pamela's presentation.

(Interruption from the audience.)

MS. DUFFY: Either stop interrupting or you please leave, because we're not going to hold it like this.

(Interruption from the audience.)

MS. DUFFY: If you're going to interrupt the whole time we're not going to move on, and we will not get to your presentation. Could you either ask her --

MS. SIHVOLA: It is --

MS. DUFFY: It is not a Task Force issue. David did it for people's information. He's willing to talk afterwards. That's fair enough.

MS. SIHVOLA: This task force is about environmental monitoring of tritium.

AUDIENCE MEMBER: I would like a better understanding of what is not in and a better understanding of what you're looking for. I would really like to have

an official explanation of all this paper I have been trying to figure out.

MR. MCGRAW: So I wanted to just remind you, you've seen in the milestone chart before where we are. We started off by circulating the draft tritium sampling analysis plan to the Task Force. We started the Task Force in January of 2000 and reminded ourselves last time this has been a long process, obviously a difficult process. You've hung in there. Thank you very much, but it is hard work. But we have accomplished a lot.

For example, the soil, sediment, and sampling surface water has been approved by EPA and DOE. That part of the sampling plan is approved. That's a major milestone, significant progress. After tonight the ambient air -- after Owen gets through his presentation -- and the vegetation will be sent to you for comment. I would like to give us about a week to get more comments from you based on Owen's presentation. So I'm quite prepared to do that before we send this on to EPA after tonight, to give us about a week to get any further comments. And then all of that will be sent on to the EPA.

We get EPA's concurrence after that, I hope, and DOE's approval. So that's the whole plan. So far we've got EPA and DOE's concurrence of this part of the plan,

and then we'll actually be able to start the sampling.

What I've represented here is that the sampling period will be about a year. It might be prudent and useful for us to come back together, even after we've started sampling, at some period in between there. It represented a year in our chart because we do want to get through a whole season's cycle.

MS. GEORGE: Excuse me, where on your chart do you show that you are verifying that there are tritiations going on in the NTL --

MS. DUFFY: Don't answer her. I believe -- Pamela, we're going to address that -- if that is your question as well -- no, we're not addressing it right now. If you would be patient and respectful, it will be in the talk.

(Interruption from the audience.)

MS. DUFFY: We're not going to take any information from the audience. Don't answer her.

(Interruption from the audience.)

MS. DUFFY: There is someone here besides you that would like to hear things. I would like you to be less self-centered.

MR. WOOD: Make it honest.

MS. DUFFY: David, I would continue right now.

MR. MCGRAW: So we're going to continue the sampling for a year. We will definitely come back as a

Task Force at that period of time. Probably in between as well, and then we'll complete our report.

One of the things we've tried to do as we have gone on in this Task Force, is we've gotten many comments from you as Task Force members that don't specifically have to do with the Tritium Sampling and Analysis Plan. But we think they're valuable comments and we've taken them into our ongoing sampling program.

So you see the last time I represented that I spent a little bit of time making a distinction between the ongoing program and the program follow --

(Interruption from the audience.)

MS. DUFFY: You can speak to that man right over there.

(Interruption from the audience.)

MS. DUFFY: There is an officer right there. There is an officer right there.

MS. GEORGE: Sir, could you please ask this man to get out of here?

MR. MCGRAW: I'm going to talk at you guys. So tonight Owen is going to talk to you about ambient air. He is going to go through the technical basis for ambient air.

I am going to introduce him to do that in just a minute. Once Owen is through his presentation we may have

time to talk about other issues. And that includes ground water and urinalysis, and there have been some other issues raised by Task Force members which we are willing to stay and talk about.

One of those is the IFEU report on the 2nd of April, and another one is NTLF operations during the sampling, the very issue that was being discussed here. So we're quite prepared to stay after and discuss those with Task Force members, members of the public. All right.

So I'm going to give Owen a chance to get started with his presentation. I want to give you a little bit of background on Owen. I think most of you have some of his background, maybe not all of it. Owen has been in the business of analyzing the transport of radionuclides in the environment for over 30 years. So he has a very long, distinguished career in this particular area. Sixteen of those years were spent as a staff scientist at Oak Ridge.

He's consulted with several federal agencies, the EPA. He has given testimony in Congress on low-level radiation. He has acted as a consultant to the International Atomic Energy Agency. He has been a consultant to that agency relative to Chernobyl.

He's been a consultant to that agency relative to developing standards for extremely low levels of

radiation, and he's also consulted with various groups, with DOE, with DOE contractors, but he's also consulted with many citizens' groups. For example, he's been involved recently in consulting with citizens' groups in Livermore.

So that broad experience, I think, speaks to Owen's integrity. People trust him regardless of what their background is, whether it's EPA, citizens' groups, Tri-Valley Care is one of the citizens' groups he's most recently been working with in Livermore.

So without any further ado, let me turn it over to Dr. Hoffman, Owen Hoffman.

MS. DUFFY: We're missing a piece of equipment here for Owen, apparently.

DR. HOFFMAN: If you remember at the last meeting there was quite a bit of discussion about the location of air monitoring stations, and several people expressed the fact that they would like to see the underlying technical basis for placement of those monitoring stations.

After that meeting I was asked to look into the matter and develop a presentation on that for you tonight, and that's what I'm about to do. Before I start, I would just like to show you what an air monitoring station looks like.

This is a typical ambient air monitoring station

for tritium that has an air intake where air is pulled in by an electronic vacuum pump that requires a dedicated power source. Air is pulled through a silica gel column. The silica gel column extracts moisture from the atmosphere, and if there was any tritium associated with that moisture, it will be trapped within this column.

As moisture accumulates within the column the column will turn from blue, a dry column, to pink, a moist column, and at the point where the moist column becomes saturated, the pink will eventually turn white.

These columns are removed each month and sent off to a laboratory for radiological analysis using liquid scintillation to measure the emissions of tritium. Any variations in the flow rate are physically recorded on a flow rate chart recorder whereby one complete circle would equal the time period of about one month.

At this time, here is the location of the present monitor at Lawrence Berkeley Laboratory. The primary criteria for the existing site is to cover the predominant wind directions. Those wind directions are winds that blow from the southwest and northwest over the building 75 hillside stack.

The other criteria is to be sure that locations of off-site residents are covered. So we have environmental station 13A that is located at the western boundary of the

site, the northeastern boundary of the site, we have environmental station 13D up around Olympus Gate, and then in the Panoramic Hills we have environment station 13C -- these three sites.

MS. DUFFY: Can you just clarify what direction the wind is going here?

DR. HOFFMAN: This is north, north. Instead of it being straight up. North is off to the side, and this shows the direction that the winds blow from. So the winds are blowing in this direction, in this direction, in this direction. These are the predominant directions of the winds as recorded by a single monitoring station that is located just to the south of the National Tritium Labeling Facility. Now, the other criteria that's used by the Department of Energy is the location of maximum doses. And if these doses exceed one millirem per year, the requirement is for the monitoring station to be placed at or near that location. In this particular situation, none of the air concentrations come close to reaching that one millirem per year level. So on the basis of those alone there is no incentive for placing any additional monitoring stations based on this Department of Energy requirement.

The other criteria, of course, is that you can't put a station anywhere you would like to. There has to be

a dedicated power supply. The stations have to be safely accessible, so they can't be placed on a steep hillside, and the instrumentation must be housed in such a manner that they're secure and secure both from weather incidents as well as vandalism.

Now about a year ago we had the first report by Bernd Franke and Tony Greenhouse, who were the independent consultants for the City of Berkeley, to look into operations of Lawrence Berkeley Laboratory. And they raised the following concern, and that is their short-term emissions at Lawrence Berkeley Laboratory. And during the short-term events it's possible for the winds to blow in directions other than the predominant directions.

They noticed that there are many sectors that do not contain air monitors and looked at other sites around the country and said there are other DOE sites where many of the sectors do have ambient air monitoring stations and suggested that Lawrence Berkeley Laboratory look into increasing the number of monitoring stations.

So the first additional siting concern expressed is representation of the standard wind directions. And that's where we were at the time of our last meeting, where David McGraw presented the following proposed sampling stations. And at that time concern was raised that these sampling stations may be too far away from the

tritium, the source of tritium released, and therefore might not be able to detect any of the concentrations of tritium that were released from that site.

So the concern was to not proceed with the placement of these stations until such time as meteorological models could be used to determine the locations where the limits of detection would be exceeded and locations where air concentrations might not meet the limits of detection, and therefore, could not be measured.

That's where we are as of March of this year. At this point we tried to look at various meteorological models that could be used and decided then that the most appropriate model to use was the CALPUFF, CALPUFF modeling system. And the reason that the CALPUFF modeling system was chosen was because this computer model accounts for changes in wind direction dependent upon terrain and topography and can produce a three-dimensional wind field based on information from 18 meteorological stations across the Bay Area, including the local meteorological station at the Lawrence Berkeley National Laboratory site.

In addition, we will, tonight, show you preliminary results of the U.C. Davis wind tunnel study and make a comparison with the regulatory model, CAP88 PC, which is used by EPA to determine compliance with regulations consistent with the Clean Air Act.

The starting point of the calculation is an assumed release of tritiated water vapor at a level of 30 curies per year. This level is consistent with the assumptions assumed in previous assessments that we have presented earlier and is assumed to be representative of releases to be anticipated in future operations of the National Tritium Labeling Facility.

Presently, we have the National Tritium Labeling Facility at Building 75. We have the hillside stack where most of the emissions occur, Lawrence Hall of Science -- but the proposal is this summer, between June and August, for the hillside stack to be taken down and replaced by a rooftop stack on top of Building 75 with the following planned dimensions: The rooftop stack will have a height of 15 feet.

The overall height above ground will be a total of 30 feet, which would be the stack plus the building height. The stack diameter would be a bit less than two feet.

Next, velocity of air would be about 25 miles an hour, and the temperature of the material being released is approximately room temperature at 68 degrees Fahrenheit. Using the assumption of a 30-curie-per-year release of tritiated water vapor and the dimensions of the new stack on top of the rooftop of the National Tritium

Labeling Facility, here is what CALPUFF predicts.

The highest concentration at 20 picocuries per cubic meter would occur just a few tens of yards downwind from the -- from the facility, but still entirely on site. Concentrations that would be one-half of the maximum would still mostly be on site. The area where it goes off-site is without residents or any occupancy.

Half of that would be at five picocuries per cubic meter, and now we have hit the Lawrence Hall of Science as well as the Math Sciences Research Institute. Two picocuries per cubic meter involves much of the upper Lab site but also goes off site. I would like to point out, however, that the limits of detection, the limits of detectability of tritiated water vapor is between 2 and 5 picocuries per cubic meter. You can't measure it lower than that.

So the rest of these concentrations we could predict through the use of a mathematical model, but we would never be able to measure it unless there were fluctuations in the amount of tritium released. And if we had higher amounts released than what is predicted for the average, then perhaps those other stations could pick up those concentrations.

So what was presented in general would show that only -- let's see, five monitoring stations would be

capable of detecting releases from the National Tritium Labeling Facility under the assumption of a standard release of 30 curies of tritiated water vapor.

Now let's back up a bit. So there is a proposal under way to relocate the sites proposed in January 2001. This proposal would move four stations closer in and in other wind sectors and add an additional station to account for winds blowing due south. Now if we look at this, we've got two of the proposed stations originally staying in place. And the reason they stay in place is these were the stations that were approved by EPA to complement the information they need for the hazard ranking and Superfund site evaluation. The station at the Math Sciences Research Center is obviously in an area of measurable concentrations. That stays in place. But these other five stations are now in new locations. These are the locations of the current proposal for adding new ambient air monitoring stations.

MR. ROCHETTE: Would you go back to the movement.

DR. HOFFMAN: Here is January 2001. We're going to show you the current situation of March 2001. You want us to repeat it? We are doing this because we've now pushed PowerPoint to its creative limit.

MS. SIHVOLA: Owen, why are you not placing any monitoring in the corporation yard where the maximum

exposures are predicted?

MS. DUFFY: Owen, can you just wait and answer questions --

DR. HOFFMAN: We'll have forty minutes.

MS. SIHVOLA: I think it's very important that questions be answered as you go along.

DR. HOFFMAN: We'll go back to any slide you like, but let me continue so my train of thought doesn't get interrupted. But the answer is, we have a monitoring station --

MS. SIHVOLA: There is nothing on the ground level. This is on the roof. There is nothing on the levels where the workers are actually walking or waiting for the bus, and this very location in the corporation yard recorded the highest concentrations in 1984, exceeding 100,000 picocuries per cubic meter.

MS. DUFFY: I think that's a good question, if you could just wait it out to the end -- Mike's was a little bit more of a clarity question. If you can just write that down and bring it up, Pamela. I see people writing, so everybody is waiting. I'm sure a lot of people have concerns or questions besides you, Pamela.

DR. HOFFMAN: Okay. Now, looking at the various wind sectors we see that virtually every wind sector now has an air monitoring station, ten of the sectors have at

least one station, and four monitoring stations share borders of about six sectors. I would like to show you results of different modeling approaches. We've just shown you the results of using these three-dimensional wind fields generated by CALPUFF.

Now I would like to show you the results using the University of California Davis wind tunnel experiments. This is a photograph of the physical model of the site that is used in the wind tunnel. It is rotated to simulate the effects of winds blowing from different directions.

It has the -- it has the attributes of buildings, of variations in topography, and variations in ground roughness created by the presence of trees. Let's zoom in on this, and now we could see, basically, they were using green pipe cleaners as surrogates for vegetation. And here is the National Tritium Labeling Facility rooftop stack, the Lawrence Hall of Science, Building 78, Building 77, et cetera.

What this wind tunnel can do is to pick up changes in wind directions of the functional ground roughness and topography. What it cannot do is pick up changes in wind directions as a result of a three-dimensional wind field, and it cannot simulate changes in atmospheric stability as a result of changes in daily temperature and so forth.

Here is the result we get from the assumption of a curie release of tritiated water vapor. Now, the prediction of 20 picocuries per cubic meter is slightly larger and in a somewhat different location as to what we had before. The ring of ten picocuries per cubic meter goes out a bit more but still on site. Even five picocuries per cubic meter is virtually on site with the exception of Lawrence Hall of Science.

The wind tunnels, of all the different methods, shows the most rapid dilution of tritium in air with increasing downwind distances, eventually unmeasurable concentrations. Even within the Lab site, the direction is due south and due west of the facility, unmeasurable concentrations as soon as one goes beyond the Lawrence Hall of Science.

The next comparison I would like to show you is that from the regulatory model that assumes there are no hills. The regulatory model uses annual average meteorology, does not account for changes in wind direction as a function of topography, does not account for changes in meteorology on an hourly basis, but simply uses the annual average information from the tower as input to calculations. But here is what we get.

If we were to rely only on this regulatory model, the result would be that there would be more than ten

stations -- actually 12 stations that would be clearly within the limits of detection. That would be a misleading impression because this model is intended only for regulatory compliance calculations. This is not intended to be an accurate representation of the wind fields and dispersion conditions of this complex site.

Nevertheless the maximum concentrations are depicted by the 20 picocuries per cubic meter, no higher than what we got for the other models, ten picocuries per cubic meter, slightly higher. The entire pattern, however, is simply a direct reflection of the annual average within the groves, so sort of a figure eight summary of modeling approaches: Seven stations are within the area where we would expect to be able to measure and detect tritiated water vapor. CALPUFF, the model that shows that, and I think I said seven -- nine, there are actually nine stations within the range estimated by CALPUFF, which is the model that accounts for changes for wind directions at different locations by creating a three-dimensional wind field.

It's based on multiple stations and considers the influence of complex terrain. The wind tunnel experiment, which produces the most rapid dilution of tritiated water vapor within short distances, accounts for changes in surface roughness caused by hills, buildings, and trees.

It does not account for changes in atmospheric stability. This factor in and of itself --

(Interruption from the audience.)

MS. DUFFY: Would you please take that outside? Is it possible to have that phone call outside? It's not really relevant to everybody.

(Interruption from the audience.)

DR. HOFFMAN: I would like to try to continue, but I start to stutter when we have this sort of interruption. But if you will allow me to try, what I will try to do is to look at your eyes, ignore what's going on out there, and if you could concentrate on me, maybe I can accomplish the art of communication. Will we try that? Are you willing to give it a try? Okay. Thank you.

The wind tunnel. The reason why the wind tunnel produces results that show a different dispersion pattern than CALPUFF is because it does not account for changes in atmospheric stability, and it's limited to the use of information from a single on-site meteorological station.

The regulatory model, CAP88 PC, assumes that the releases occur over a flat terrain and, again, is limited to the use of information from a single on-site meteorological station and uses only the annual average summaries of this information. It does not account for hourly variations.

Now the features of the expanded proposed network are as follows: There will be 15 ambient air monitoring stations in total. Seven of these stations will be located within 300 meters from the planned rooftop stack on Building 75, which is the National Tritium Labeling Facility (inaudible) stations, according to the CALPUFF stations, will be located in areas where the average air concentrations exceed the anticipated limits of detection for the 30-curie per (inaudible) stations that will detect it.

If the releases are less than this, then fewer stations will be able to detect it. The proposed stations now cover all major wind sectors.

(Interruption from the audience.)

DR. HOFFMAN: Ten of these sectors contain one station, four stations border the remaining six sectors; and, by the way, an additional benefit of this high density of monitoring stations that are close in to where tritium can be measured is that now the mathematic models that are used to verify, if it's shown that the models don't match what's measured, they can be calibrated and increase the confidence with which that information can be used for making decisions.

Now, I mentioned before that the dose estimates were much lower than the DOE standards, and yet I think --

and I'm just partially saying that the laboratory has been responsive both to the recommendations of Franke and Greenhouse and the concerns expressed by the community during our last meeting. If those concerns weren't expressed, the stations would be out at their most distant locations. They've been brought in and an additional added.

The doses, however, resulting from the maximum predicted air concentrations have been evaluated. We have evaluated them. We find them to be below -- they're small fractions of the regulatory standard. They're way below the negligible dose level of one millirem per year recommended by the National Council on Radiological Protection Measures.

Now to put this into perspective, we're going back to one of my early presentations, and we're going to use the graphic of a thermometer. But this thermometer has values that are separated by factors of ten. It's a logarithmic scale.

At the top we have the dose limit for the general public recommended by the International Commission on Radiological Protection, the National Council on Radiological Protection, the Nuclear Regulatory Commission and the DOE of 100 millirems per year.

But for single facilities releasing materials into

the air, EPA has promulgated its national emission standards for hazardous air pollutants as part of the Clean Air Act, and it has set its limit at 10 millirems per year. Again, the NCRP, negligible dose levels at one millirem per year. All of these limits are in addition to natural background. Natural background in Berkeley, in terms of an effective whole-body dose is about 260 millirems per year in the Bay Area, and much of this is due to the presence of indoor radon.

Now, what are the doses associated with the air concentrations we've just shown you for emissions around the National Tritium Labeling Facility?

MS. SIHVOLA: Do you have references for the indoor radon? Because in California the amounts should be very, very low compared to the east.

DR. HOFFMAN: It is. It is. So throughout the rest of the country it's much higher than that. Radon, even in California, is a major driver of radiation emissions. And the primary reference I deal with is the National Academy of Sciences, what's called the Bare Six Report of 1996.

Now, our dose estimates for these air concentrations that we are showing you on a contour map, these are our own personal dose estimates that do not use standard techniques. We account for full uncertainty

analysis, including the uncertainty in internal dosimetry of H2O that is inhaled and absorbed by the skin, the annual average rates of individual inhalation, and the fact that the radiobiological effectiveness of an absorbed dose of tritium may be much larger than one.

And as I mentioned in previous presentations we include this as a probability distribution rating from one to five with a mode of two. Using the upper bound of a 95 percent confidence and including the suggested quality factor, here are the results that we get.

At 10 picocuries per cubic meter, much less than .1 millirem per year. In fact, all of these are very small fractions of the kinds of standards normally used by regulatory authorities to decide about the acceptability of radiation exposure to the public.

Now, what would happen had we not used our estimates of uncertainty, had we not accounted for the quality factor for tritium? What if we were to use the EPA method for calculating dose? Here's what we would have gotten.

We would have used the central estimate of the percent confidence which excluded the adjustment of the (inaudible) fact that the tritium using a (inaudible) factor of over 1.0 and the doses for each of these concentrations would be lower still by almost a factor of

ten.

Now I would like to say this, up until this time when I have had a chance to look at the full contours predicted for a 30-curie release, and we have had a chance now to look at maximum off-site doses from inhalation and skin absorption from these air concentrations, I can confidently say this is the lowest risk issue I've had in my professional career to deal with.

I don't know what the deal is. However, I must also say that the discrepancy between outrage and risk is the largest that I've seen anywhere in the country. I hope this presentation here can help at least reduce the gap that currently exists. Thank you.

MS. SIHVOLA: I wanted to ask you something about the circumstances, how is it possible that there are ground water concentrations exceeding the EPA's drinking water standard?

MS. DUFFY: Pamela has a question.

MS. SIHVOLA: Can you make a correlation to that, which is a fact?

MS. DOUGHERTY: There are a number of questions. People have raised their hands, and the first person who I saw was Paul Lavely, representing the University of California. Pamela Sihvola also has questions.

MS. DUFFY: Sue Markland Day had a question.

MS. DOUGHERTY: We want to make sure all of you get equal time in the question-and-answer period. We have 40 minutes. We will go over it if we need to because there are so many questions of Dr. Hoffman's presentations, I suspect, so just try to make your questions brief, to the point and --

MS. DUFFY: You can have more than one, but just be respectful that there are more than one person here.

MS. DOUGHERTY: I think we start with Paul and Pamela and Sue. We'll go on.

MR. LAVELY: One of the things we just saw was that the EPA had talked about the use of ethylene glycol rather than silica gel. However, we asked the EPA's Lab to give us a formal opinion as to which is actually better --

MR. ROCHETTE: You asked who?

MR. LAVELY: NAREL, the EPA Lab in Montgomery which does the analysis of the split. We asked them which is actually better. And they are not apparently real sure that there is really any difference, better or worse, between the two. They're just different.

So I noticed that, you know, they use silica gel. They could just as easily use ethylene glycol or some other medium. But do you have a professional opinion about the efficacy of silica gel?

DR. HOFFMAN: Aside from recovering moisture from

the atmosphere, there are problems with it at Los Alamos because of the very low humidity of the atmosphere there. But that's not a problem here at Berkeley.

What I am impressed with is that liquid scintillation can get down as low as two to five picocuries per cubic meter. In the past the limit was much higher. In fact, at one time as high as 1,000 picocuries per cubic meter.

In my own analysis of this, knowing that past emissions were much higher than at present time, it still doesn't look like off-site doses could come back close to one millirem per year.

MR. LAVELY: Can you go back to your earlier slide that showed the lines of the concentrations?

DR. HOFFMAN: From which models?

MR. LAVELY: Doesn't matter.

DR. HOFFMAN: We'll go to CALPUFF.

MR. LAVELY: Could you use your pointer to show where the line would be that you would be able to detect and measure that real-time?

DR. HOFFMAN: Now you're saying if the EPA were to use --

MR. LAVELY: No. Anybody. If anybody were to have a real-time monitor --

DR. HOFFMAN: Where would they put it?

MR. LAVELY: Where would they put it that you would --

DR. HOFFMAN: There is only one place. There is only one place possible that they could put it, and that's inside the stack. Because the detection limits of real-time monitors are many orders of magnitude less sensitive than the detection limits of silica gel.

MR. LAVELY: Let me rephrase. How far away from the stack -- in the prevalent wind, the existing wind direction, not prevalent, the existing wind direction, would you be able to detect using the real-time monitor?

DR. HOFFMAN: Not outside the stack. It can only be directed inside the stack. Once you go outside of the stack the amounts of dilution are so much that you are incapable of measuring the concentrations of tritium.

In fact, Michael Ruggieri, I asked him what is the detection limit or the Overhoff system. And he said 500,000 picocuries per cubic meter. Overhoff himself thinks it's a bit lower than that, 10,000 picocuries per cubic meter.

There is no way with these numbers that you would be able to put such a system in the field and have it detect anything other than a nondetectable quantity.

MS. DUFFY: Did people get Paul's questions? You think so? Go ahead.

MS. DOUGHERTY: Paul, would you clarify?

MR. LAVELY: There have been a lot of questions about why we don't have a real-time monitor, why LBL -- or U.C. doesn't put a real-time monitor on the top of the Lawrence Hall of Science. And the answer that I've heard from Overhoff and you've heard from Overhoff is it wouldn't be able to detect anything.

DR. HOFFMAN: Right. And so if you wanted to give the impression there is no tritium whatsoever, that's the right thing to do because you give the impression that there is no detectable level of tritium.

MR. LAVELY: But just for your information, we've started the air monitor back inside the Lawrence Hall of Science, and this week we got the first results. And they don't seem to be uniquely different from the LBL results, from the outside.

DR. HOFFMAN: So the indoor-outdoor is not appreciably different?

MR. LAVELY: Not appreciably.

MS. DOUGHERTY: For the second question, I believe it was Pamela.

MS. SIHVOLA: Could you put the CAP88 graph -- do you have an overhead projector?

MS. DUFFY: I'm sorry, we do not.

MS. SIHVOLA: I have a question. If you would be

kind and pass these to Owen as well and to everybody. We ran --

We ran some CAP88 weather data (inaudible) and, Owen, isn't it true -- first of all, let me ask you a question.

Regarding CAP88, isn't it true that you can calculate the concentrations within one wind direction sector? For instance, when you are running the model for the Lawrence Hall of Science, you will be able to put the right input parameters into the model to give you predictions pretty much any distance from zero, 25, 50, 75, et cetera. So what we have done is taken the wind direction sector which includes Lawrence Hall of Science, and used the 100-curie source which has been the one used by the LBNL risk assessment, and at Lawrence Hall of Science the concentrations are much higher than what your run predicted.

Our run came up with 2,200 picocuries per cubic meter, and the difference is that from the perspective of the maximally-exposed individual at Lawrence Hall of Science, in this wind direction sector the stack height must be made zero instead of the several dozen meters that you are using when you are running the CAP88.

So my question to you is, why do you not run the calculations in this manner which is very accurate for

that particular wind direction sector and gives you readings, you know, a couple of hundred -- a hundred times higher?

DR. HOFFMAN: If I may answer.

MS. SIHVOLA: Why aren't you putting the stack height to zero when you were running the model for this sector?

DR. HOFFMAN: The question -- if I can paraphrase your question is, in running CAP88, why didn't we assume a zero height release instead of the stack height.

And the reason this is sometimes done is because of complex terrain and the fact that CAP88 assumes a flat land release. So to overcome difficulties with complex terrains sometimes CAP88 is run ignoring the effects of the stack height.

Now, in your example here you have given some figures for a 100-picocuries source term, and there is no way that these concentrations could ever be a result of 100 picocuries.

MS. SIHVOLA: Sorry, it's a hundred curies.

DR. HOFFMAN: Given what we know about the wind flow patterns from this location, there is no way that these numbers could be realistic. Yes, if you run the model with special assumptions you can produce any result you want, but I would never stand behind these results.

MS. SIHVOLA: But my question to you is, why do you not put the stack height to zero when you were running the model for the maximally-exposed individual at the Lawrence Hall of Science?

DR. HOFFMAN: And the reason why is that is not a realistic assumption, especially for the case of siting the additional monitors around the site. And as you can see, even with accounting for the stack height of the stack on the Building 75 rooftop, we're not producing concentrations dramatically different than ones produced from the other methods. However, because it is assuming flat land terrain and only the annual average information from the one meteorological station, the downwind dispersion is much less, much less than given by the wind tunnel study and somewhat intermediate between what's given by CALPUFF.

If there is one model that I would stand behind as a scientist, it would be that that was produced by CALPUFF, not CAP88. In fact, Berndt Franke has complained bitterly about the misuse of CAP88 for these purposes. He personally recommended using a model that could take into account complex wind field patterns and complex terrain.

MS. SIHVOLA: Owen, the other question I have is related to the next flyer. It's right there in front of you. This is from the LBL environmental report of 1984.

You look at the summary of environmental HTO concentrations, table six.

And there was a monitor for about seven months in the corporation yard, which measured maximum concentrations of a hundred thousand picocuries per cubic meter. For a strange reason this monitor was discontinued in July, and a second monitor was placed a little bit further away which, as we understand, was further moved away and put up on the roof of Building 69.

You have laboratory results measuring concentrations of a hundred thousand picocuries per cubic meter of air right smack in the corporation yard which, according to all of your models, is where they have impacted -- highest concentrations are impacting LBNL workers. These are very high concentrations. Even the 69A monitor measured over or close to 4,000 picocuries per cubic meter on average for that year.

These are very measurable concentrations.

DR. HOFFMAN: But not at that time. First of all, I've not have a chance to study these results.

MS. SIHVOLA: This is from LBNL's own report. I had two questions. In light of this fact their models show that the highest concentrations are right around in this very area, why are there no attempts to put monitors on the ground level where people are actually walking or

waiting for the bus or parking their car or -- this is a place where human beings are working.

Has LBNL personnel who worked in Building 69, 77, 78, have they been consulted and have they agreed to be the target of higher doses now that the stack is being removed even closer?

These data reflect when the stack was up on the hill. I think this is -- the LBNL personnel, they are human beings as well. I think everybody should be well aware of this change and how it might impact their movements outside the workplaces. And I think their input should be solicited by the

Laboratory.

MS. DOUGHERTY: Could you place that in the form of a single question, so Owen can answer and we could move on? What is the question specifically?

DR. HOFFMAN: I think I can paraphrase. First of all, it is the concern that these various air monitors, that some of them such as this one at environment 69 is placed up on a rooftop and therefore might not be representative of the ground-level concentration to which people would be exposed. That's the assumption.

I have no reason -- I have no reason to know what the physical mechanisms would be to cause air concentrations at the rooftop to be less than air

concentrations at the ground level in this region.

And, in fact, if anything it's the opposite direction, where the concentrations at the rooftop, because of the relevant elevation with respect to the rooftop stack, that one would get higher concentrations as opposed to lower concentrations.

The other point you made is that certainly Lab personnel should be aware of whatever changes are --

(Interruption from the audience.)

MS. DUFFY: Okay. Task Force members. We're going to take a break right now.

(Recess)

(Reporters change places)

MS. DOUGHERTY: Dr. Sue Markland Day had a question. And she is the next person on our list. Dr. Day, that would be you.

MS. MARKLAND DAY: Actually, I am not a doctor. Thank you, though. I appreciate it. Actually this is a really simple question. I am just curious, if we move the stack and it is in a different location than prior years, are we going to end up with a lot of questions about historical data, comparing it with data we generate from now on?

DR. HOFFMAN: I think any time you make a decision to change things from the way things were in the past, such

questions are naturally going to arise. And I think that will be one of the challenges to deal with. But I think it is a real improvement to remove that hillside stack, and put the source of release right on top of the National Tritium Labelling Facility.

And for one thing, it really increases the amount of dispersion between the National Tritium Labelling Facility and the Lawrence Hall of Science. The amount that is being released -- I mean, we are really talking about small quantities. However, the attention given to this in this community, you would think that we are dealing with something that is 100,000 times higher. Most of my professional risk assessment is dealing with issues where the doses were 10 rads and higher, or 10,000 millirems and higher, to members of the exposed public.

And once I went through this exercise I was really surprised at how low this issue is. But in answer to Pamela's question, what about lab employees? Should they not be told about what has been happening? Of course, they should be told what is happening. And I think they should be in full disclosure of all actions that are going on.

MS. SIHVOLA: Regarding the possible impact that this change in the stack location might have on their work environment.

DR. HOFFMAN: And David is here. The Laboratory

is certainly committed to take your suggestions very seriously.

MR. MCGRAW: One of the things you might like to do at the end of the meeting, Pam -- because I don't know where they are in the process -- but Dr. Zeman, and myself, and Ron Pauer have had conversations about this very issue. And one of the things we have agreed we need to do before that project is completely underway is have those discussions. We always do that. We disclose data to our employees all the time, and they get the same environmental annual disclosure reports, and they get, if they are on a dosimetry program, those reports. But your point is well taken. But the fact is we do do that. We plan to do it in this case.

MS. DUFFY: I would like to go back to Sue because I wasn't sure if you were you finished with your questions. Do you have more?

MS. MARKLAND DAY: The other one is you said that these recorders were self-contained energy sources.

DR. HOFFMAN: No.

MS. MARKLAND DAY: They are not self-contained?

DR. HOFFMAN: If they were self-contained there would be no problem where you put the site. They need a dedicated power source. So you have got to tap into existing power lines. And that is one of the limitations

involved if we are practically siting an ambient monitoring station. It has to be close to an electrical source that you could tap into.

MS. MARKLAND DAY: And before anyone else brings it up, my understanding about when we had blackouts and rolling brown outs is that LBL is protected from that anyway, right?

DR. HOFFMAN: That is what I have been told by the Lab.

MS. DOUGHERTY: David, do you want to answer that?

MS. DUFFY: Did you get that question answered about the legacy issue? Was that acceptable to you? Did you feel that answered your question?

MS. MARKLAND DAY: I think that is going to have to happen. If you are going to improve things you always have a problem looking at the way it was done, and wasn't done as well. And it was in the past. And it is like apples and oranges. And you just can't do it anymore as far as comparison. That is fine with me, but I thought it would be worth saying something about it.

MS. DUFFY: David, did you have something?

MR. MCGRAW: No. You were going to ask me to respond to the rolling blackouts, but it has been answered. We are protected, and the question was answered.

MS. DUFFY: Who was next? Fran.

MS. PACKARD: This is more -- you said something about if the results didn't match the models pretty well, you were going to make adjustments. My question is, what are you going to adjust? Are you going to adjust the mathematical model? Are you going to move the thing around to get it to say what you think the model will say? What are you adjusting to which?

DR. HOFFMAN: One of the things is mathematical models are an outcome of numerous assumptions of numerous parameters. It is not surprising that when you finally have a density of monitoring equipment like this, that in some wind direction the model might be tuned at the Lawrence Hall of Science and reproducing those air concentrations, but not reproducing an air concentration in another wind direction.

What then is adjusted are the assumptions in the model to try to get the right fit, or changing some of the mathematical algorithms in the model, so that the model is tuned to the site to give more reliable results.

MS. PACKARD: I thought the data you actually collected would be the results. You measure the stuff in the sillica gel thing. And you look at it, and you look at a bunch of them. And that is the data.

DR. HOFFMAN: There are two types of results. One is the result of the model, which would be these

isoconcentrations. That is a result. Another type of result is what you measure at this station. But notice there are other locations where there are no measurements. What is the confidence that we have that what this model is predicting here is correct? So what we do is say, "Well, how confident are we that it is giving the right prediction at this location, and this location, and at that one?"

Once we are able to adjust the model to the network of the modeling system, we then think we can get more reliable predictions of these other locations.

MS. PACKARD: Thank you.

MS. DOUGHERTY: Next question was Mike Bandrowski.

MS. DUFFY: No, I think Evelyn was next. At least we told her she was next. I told her that. Mike, is that okay with you?

MR. BANDROWSKI: Yes.

MS. FISHER: Since our discussions have all been based on the 7.5 meter rooftop stack, may I ask if that move has been scheduled yet?

MR. MCGRAW: Has the work been scheduled yet? Is that your question?

MS. FISHER: Yes.

MR. MCGRAW: I am getting a little deaf. I am sorry. Too many concerts in the 1960's. Is that what you said?

MS. FISCHER: Yes.

MR. MCGRAW: There is a schedule for the work. And schedules slip, of course. Don't hold me to this, but right now the work is scheduled for, I think it is April, to start in April. It will be finished around May. I would have to go back and check my notes, but there is a working schedule right now.

MS. FISHER: And at that time the underground portions will be removed?

MR. MCGRAW: No, the underground portion will be left in place.

MS. FISCHER: And that will cause no problem?

MR. MCGRAW: We will continue to sample there, but we can't imagine how it would cause any problems at the that levels that we have there.

MS. DOUGHERTY: Evelyn, is that your only question?

MS. DUFFY: Did you have something in mind that it could cause a problem, Evelyn?

MS. FISHER: No, but I am going to report back to my group. And I know that is the sort of thing they will ask me.

MR. MCGRAW: I think the issue here that people wonder about is that there is tritiated water vapor going through the stack system. And some of it will deposit on

the inside of the stack. And so, one would expect that in that portion of the stack that is underground, there will be some. Now, we are going to -- when we do the stack removal -- do some of that sampling then, to try to characterize that. We expect that to be a very small level.

Secondly, the system itself would have to be breached for it to cause any problem. And we sample the soil in the area on top of that.

MS. SIHVOLA: Can I ask a follow up question regarding Evelyn's question?

MS. DUFFY: Regarding Evelyn's question?

MS. SIHVOLA: Regarding Evelyn's question because I think it is a concern to the community. We both live in the same neighborhood, and it is a concern.

MS. DOUGHERTY: Let's call on Mike. He has not had his turn yet.

MS. SIHVOLA: It is specific to the stack. And I wanted to ask Mr. McGraw, what is the environmental documentation, and the environmental sampling, and environmental plan for decommissioning and decontamination process for this stack removal? And how is it going to be conducted in the public?

MR. MCGRAW: I don't have the plan in front of me, Pam. So I can't answer your question. And I am not going

to answer it off the top of my head. I do want -- Gary has corrected my schedule. The schedule is from June to August. So, you need to report back to your folks that I misspoke when I first estimated it there. So it is June to August. So there will be a work plan, Pamela. That is one of the things that perhaps we can discuss afterwards, what you think should be in that, or what you think the community thinks should be in that. But I haven't seen it in detail until yet.

MS. SIHVOLA: We asked EPA to amend the Superfund Sampling Plan to include extensive soil sampling around and under the stack, the subterranean portion of the stack, because it is possible that during the past 40 years corrosion may have breached the stack. It could have moved in the earthquake. And it is possible that for many years tritiated water vapor has been pushed into the soil itself. So, we would like to have the soil sampling around the underground portion of the stack to take place as part of this sampling plan.

And I have a request, which I will pass around regarding this very issue. And we would like to have copies of the environmental documentation that you are preparing. And we would like to have a public meeting regarding that very issue.

MS. DUFFY: Let's go back to Owen at this point.

MS. DOUGHERTY: Evelyn, did you have another question, or was that the only question?

MS. FISCHER: No.

MS. DOUGHERTY: Mike Bandrowski is next.

MR. BANDROWSKI: It was a nice presentation. If you could go to the slide on the Calpuff results. I was curious, since some of the monitors are located at the area that is at the limit of detection, would it make any sense there and then -- maybe the one at the top is near the five line at Space Sciences Lab -- would it make any sense to move those closer in?

DR. HOFFMAN: This is right at the top of the limit of detection. The minimum limit of detection is the two line, here. In that same basic wind direction, wind sector, we also have environment 69. I don't think -- the other difficulty moving it closer in is there is no power source.

MR. THOMAS: It is just a hill.

DR. HOFFMAN: This is the nearest practical location in that direction after environment 69 to locate a station because there is the availability of power at that location.

MS. DUFFY: Brian said there is a hill there.

MR. THOMAS: There is a hill there.

MS. DUFFY: Is that it, Mike?

MR. BANDROWSKI: Yes, I was just curious.

MS. DUFFY: Nabil is next.

MR. AL-HADITHY: The Overhoff, I think that Paul Lavely brought that up earlier. Is this the same equipment that was proposed for an earlier proposal to USEPA EMPACT runs? Is that the same piece of equipment, Pamela, the Overhoff equipment?

MS. SIHVOLA: What are you referring to?

MR. AL-HADITHY: I am referring to the sensitivity. We heard earlier that the Overhoff is sensitive to 500,000 picocuries per cubic meter.

MS. SIHVOLA: No, the Overhoff system that was proposed under the EMPACT grant has a detection limit of 100 Becquerels per cubic meter.

MR. AL-HADITHY: I need someone to translate that for me.

MS. SIHVOLA: You multiply that by 27 to get picocuries.

MR. AL-HADITHY: 100 Becquerel per cubic meter and multiply it by 27.

MS. SIHVOLA: It is about 2,700. So this was the reason why we had requested to get an Overhoff real-time monitor and place it in the grove between the NLTF and the Lawrence Hall of Science. And we are absolutely certain that it will pick up concentrations, real concentrations.

MR. AL-HADITHY: Even though the item from 1984, that you showed was 100 plus or minus 30 picocuries?

MS. SIHVOLA: 100,000 picocuries per cubic meter.

MR. AL-HADITHY: Could someone please translate that number? 100 microcuries per milliliter --

MS. SIHVOLA: Minus 9th.

MR. AL-HADITHY: Is that a picocurie per meter?

MS. SIHVOLA: No, it is microcuries per milliliter.

DR. HOFFMAN: This is the first time I have seen this. If we accept everything on the page as typographically correct, then Pamela is correct. Then it is 100,000 picocuries per cubic meter. However, it is not evidence as to what really is being measured here.

And so during the break I have gone to David and said, "What is this?" He said, "All we can do is take this under advisement, and respond after we have had a chance to study the document."

MR. AL-HADITHY: So the 100,000 is on this page. We also had a water sample from rain, which was about 800,000 picocuries per liter. So, how does one reconcile a number like this, and a number in the rain to dispersion models from both Calpuff and CAP 88, which shows maybe 100 picocuries per cubic meter is the outside maximum. What is wrong with the two scenarios?

DR. HOFFMAN: A lot. I looked at this the first time and, of course, in the back of my mind I am trying to think of ways to resolve the discrepancy. And I am kind of at a loss because if you think of historic releases, the maximum release was, in the 1970s, at around 600 curies in that year. Let's say the stack monitors weren't as efficient as they are now. Let's say maybe it could have been even higher. I still couldn't get 100,000 picocuries in a downwind air sample. So, I am at a loss to explain this number. And that is why I say the best answer is take this under advisement. Let's look at it.

MR. AL-HADITHY: We will come back to this some other time.

DR. HOFFMAN: Yes, because based on the analysis we have done I can't see how such high concentrations have been --

MR. AL-HADITHY: The question has been brought up. And I think it would be interesting.

MR. LAVELY: You asked me too -- I had a long conversation with Overhoff. The best answer to your question is let me call you at your office and give you Overhoff's phone number. Why don't you ask him, okay, really?

MR. AL-HADITHY: You still feel there is a discrepancy between the 2,700 and 500,000.

MR. LAVELY: Based on what he told me, what Owen just said is still correct, that his monitor would not be able to detect the levels that Owen mentioned. Even at its best it wouldn't. But I would like for you to get that from Overhoff rather than from me.

MR. AL-HADITHY: That is fine. Thank you.

MS. SIHVOLA: Paul, the model he has proposed for EPA has 100 Becquerel per cubic meter detection limit. It is different than what this currently is at NTLF.

MS. DUFFY: Paul, Overhoff --

MR. AL-HADITHY: I will talk to Overhoff.

MR. LAVELY: I have the answer, but I would rather have Overhoff represent his own equipment.

MR. AL-HADITHY: I had two more questions. On the zero stack heights, perhaps if these -- I am not quite certain why a zero stack height is not used. Even though I hear what your argument is in terms of the topography, et cetera, I still don't really understand why it is not identified. They are showing things here, which are in the realm of the published numbers. And if those published numbers are correct then perhaps the zero stack items make more sense than a 10- or a 100-meter stack.

DR. HOFFMAN: My answer is not just knowledge of atmosphere and physics. The air released from the stack does not impact and slide in with a hill. You have laminar

flow of air patterns over the hill. And that is why our preference would be to use Calpuff. And what we do is to show a comparable calculation using CAP 88. But these mathematical models are such that, like a chainsaw in the hands of a child. If you want to abuse them, you can get any answer you want.

MR. AL-HADITHY: I don't want to belabor the point at all. I just want to say if the numbers are right, then maybe there is something wrong with our models altogether. And they don't predict the 100,000 picocuries.

Is the air through the stack, the new stack on top of the NTLF, is that going to increase in volume, or in rate, or anything? Or is that going to be the same rate and volume as it is currently?

DR. HOFFMAN: I have to have one of -- Gary, could you answer that the question? The question is, will exit velocity or volume of the air from the new stack be much different than the volume of air exiting per unit of time at the old stack?

GARY: I think we will have to issue that information in a memo.

MR. MCGRAW: It is not going to be exactly the same, Owen. They are not significant, but we will get you the precise design parameters.

MR. AL-HADITHY: Thank you. Two more things. I

like the fact that we have heard that the Laboratory is considering doing an analysis of seismic and fire. That is very much appreciated. And, again, I want to repeat something that we said earlier. We would like to have a chance to influence the type of study of LBL initiates for the seismic safety and other safety aspects. Thank you.

Lastly, I think -- I just wanted to quickly announce the City of Berkeley has IFEU coming on Monday to give a presentation at the North Berkeley Senior Center, at 7:00 p.m. is the official meeting. Everybody is welcome to come. Unfortunately, we have only had time to identify two stakeholders, LBL and CMTW, for a little bit more time than others. I know I have heard from several people who are unhappy that only these two single organizations have been singled out. And I hope you will bear with us -- and especially you, Paul Lavely -- and allow us to comment with this method. Thank you.

MS. DOUGHERTY: Sue had a question, and then I would like to go to Michael. And then I would like to get to the members who have not had a chance to speak before we return to those who have.

MS. MARKLAND DAY: Could I see the Calpuff graph up there again? This is a really simplistic question, but I think of those looking much like the terrain markers when I am trying to hike on hikes, and trying to figure out how

much up and down I have to do. I might not be looking at it quite the right way. Where the two line is, will there be a comparable two up on the upper right-hand side above the five somewhere?

DR. HOFFMAN: Yes, we will show you that in a second.

MS. MARKLAND DAY: How far away is it?

DR. HOFFMAN: We will show you. We have another version of this graph, that instead of being on the scale of 1 kilometer, goes up to 4 kilometers. So here it is. So here is the scale of the full two that includes the station at the University of California Botanical Garden. And this is the total range of the below detection limit concentrations. So, you can see there is very little.

MS. MARKLAND DAY: Can you point out where Grizzly Peak and Centennial meet?

DR. HOFFMAN: I am not a Berkeleyite, but I believe it is somewhere up in here.

MS. SIHVOLA: About where number 2 is.

MS. MARKLAND DAY: Where number 2 is?

MS. SIHVOLA: That is about in front of your window.

MS. MARKLAND DAY: Just about, I agree.

DR. HOFFMAN: Grizzly Peak is right there. And, in fact, right near the Alameda County line. The Alameda

County line is here. And here is Grizzly Peak. And that is called Frowning Ridge.

MS. MARKLAND DAY: Very interesting. Thank you.

MS. DOUGHERTY: We have other members that have not yet spoken. Michael Rochette.

MR. ROCHETTE: I would like to thank you also. I thought that was a very interesting presentation and very well done. I just have a few questions that I would like to clarify. I will start from the top. When you are doing your modeling for the atmospheric emissions from the NTLF, do you have the capability to model that emission and realize the impact that it is having on groundwater?

DR. HOFFMAN: We have the capability. We haven't done so. And the way that is done is to look at the transfer of tritiated water vapor as it changes phases from a gas to a rain droplet. And then we estimate the concentration in the rain droplet as opposed to all the other rain droplets that have no tritium in them. And then that would determine the initial concentration of the surface soil.

The concentration in groundwater would be dependent upon a complex numbers of factors, namely uphill recharge volumes of water interacting with the concentration of surface soil and surface water that originated from the rain immediately above it. And so, there is some dilution

that occurs. So, that calculation can be done. We have not done it.

MR. ROCHETTE: I guess, I think that would be information that would be helpful, to look at the concentrations that are present in the groundwater and use those concentrations kind of as ground truthing for the modeling.

DR. HOFFMAN: That would be possible if the only source of the tritium was the atmosphere.

MR. ROCHETTE: Well, I would suggest that what would be performed would be, for part of the modeling, that you would only use that point source of the emission from the stack. I imagine that you have also done previous modeling for the CAP 88 with the existing location of the stack as it is right now. Isn't that correct?

DR. HOFFMAN: Right.

MR. ROCHETTE: So, that would be one of the locations you could use to ground truth the groundwater concentrations that we see presently.

DR. HOFFMAN: Again, the difficulty with that is that we would have to exclude the fact that there may be releases of tritium, or releases in the past, directly to groundwater without it being an atmospheric release. Now, if we can eliminate water sources we can --

MR. ROCHETTE: That is a different aspect to the

evaluation of sources. We can talk about that later. But I think just to focus on the actual emission itself as being a potential source, I think that would be helpful.

MS. DOUGHERTY: Michael, did you want to address anything about that to David as well as the representative from the Laboratory? Would that be helpful?

DR. HOFFMAN: What I was thinking about is also there is a difference between ground truthing real-time emissions on into the future using your air monitoring station versus using groundwater that might reflect historic emissions. And so, the current purpose here has been looking at monitoring present day and future emissions. And you have to change perspective.

MR. ROCHETTE: The importance of doing that, then, though, is you could look for and identify other potential sources. So, that kind of comes as a secondary aspect of that evaluation.

DR. HOFFMAN: Right.

MR. ROCHETTE: On a different point, I wanted to let you know that I am familiar with Lawrence Livermore National Lab where they do have portable treatment units for groundwater sampling that are self-contained units that are mobile. And I believe those are self-powered with solar rays. So they can get power to different locations, and set up these mobile treatment units. And I imagine --

I am not sure about the power requirements for air monitoring, but they probably aren't that much dissimilar from groundwater pumping through carbon. So, that might be something you could look at. I am sure you are familiar with the TTUs over at Lawrence Livermore National Lab for groundwater.

DR. HOFFMAN: We have Chris Serrano here from the Livermore Lab, and it has been his program. Chris, would you like to comment on this?

MR. SERRANO: I do most of my work in the restoration department. I don't believe the units are solar-powered. That program is in a different part of Environmental Protection than I am in. I am in the monitoring part of the operation. The restoration people do the treatment units. There are some solar-powered pumps in our retention basin. To my knowledge, I don't believe that the treatment units are solar-powered themselves.

MR. LAVELY: We have solar-powered air samplers that we have been testing. But the difficulty is if you want the reliability and the accuracy that is being demanded of LBL, you are going to have to have one that has got a 110-volt power supply, I believe.

MR. ROCHETTE: I imagine that is probably true. But just to let you know there is some of that technology out there that I am sure you are probably familiar with.

One other thing that, I guess, I certainly want to express a strong concern about is the removal of the stack itself. We have only heard about this as an agency here at this meeting.

MR. MCGRAW: We actually announced it at, at least, the last meeting.

MR. ROCHETTE: Yes, at the last meeting, and then tonight. Because the tritium stack is identified as a potential source of the groundwater contamination, we would consider the removal of that stack part of an investigation to evaluate the sources for groundwater contamination. And we would anticipate the submittal of a work plan for that removal that would allow for Water Board review, and approval of that work plan, and to include sampling, and discussion on the relocation of the stack. So, I imagine that is something that you have considered, and that we will be receiving.

And in case that isn't the case I would like to request that we do receive that. And I think that would be helpful for the long run in the overall evaluation of tritium contamination associated with the NTLF.

One other thing was, Owen, about your presentation this evening, I didn't actually receive a copy of it. If I could, I would appreciate that.

DR. HOFFMAN: Does he not have a copy? We made a

huge effort today to be sure there were paper copies of the presentation. You should have a color copy because you are a panel member.

MR. ROCHETTE: There is one here now. Thank you, very much.

DR. HOFFMAN: We made a concerted effort to be sure everyone had one. Thank you for your comments. Do you have any more?

MR. ROCHETTE: No, I think that will be it, Owen.

DR. HOFFMAN: If I may respond to Nabil. We have got the information for you. The existing stack, which is on the hillside has a height of 8.5 meters. So it is about less than twice as high as the stack that will be put up on the rooftop of the NTLF. But when you look at the combination, the stack plus building height is 9.1 meters. It is slightly higher than the existing stack. The stack diameter of the new will be a little more than a half meter or 2 feet wide. The old stack was 3 feet wide.

The temperature of air released from the existing stack is at 75 degrees Fahrenheit. Here it was assumed to be 68 degrees Fahrenheit, or still about room temperature. The difference is from an air-conditioned room to a warm room. The amount of air coming out of the existing stack compared to the amount of air coming out of the new stack is at

about 12 meters per second or 25 miles per hour. That is about two-and-a-half times the velocity of air currently coming out of the existing stack, which is at 4.5 meters per second. Does that help?

MR. AL-HADITHY: Thank you.

MS. DOUGHERTY: A couple of comments real quickly. Task Force, you have noticed, I am sure, we are staying on Agenda Item Number 4, Task Force Discussion of Ambient Air Monitoring Stations. Several of you have not yet had a chance to ask your questions. And we would like to give all of you a chance to ask your questions. We may not, and actually will likely not, get through presentation points numbers 6 and 7, in order to allow for public comment in just about 10 minutes.

So, if those of you who have not yet asked your questions can try to formulate them quickly, so you can ask Owen, and we could wrap up for public comment, we would appreciate that. Thank you.

MS. SIHVOLA: Can I make a statement at this point? I have been asked on behalf of the audience to make a statement regarding what happened here tonight.

MS. DOUGHERTY: We need to let the rest of the members --

MS. SIHVOLA: I would like to say because I have been asked --

MS. DOUGHERTY: We need to let the rest of the people ask their questions. Thank you, Pamela. Keith Matthews.

MR. MATTHEWS: No comment.

MS. DOUGHERTY: No comment. Okay, Carl.

MR. SCHWAB: I guess Nabil stepped out of the room. Oh, he is right behind me. You had asked about the modeling and the use of the zero stack. That question I discussed with Barry Parks, who was one of the key members in writing the CAP 88 model. And he knows the situation in Berkeley, you know. He is now a DOE employee at headquarters, but he used to work for EPA. He said that using zero stack height in this situation would not be the correct thing to do for this model. I thought that might help. No question.

MS. SIHVOLA: I have a question.

MS. DOUGHERTY: One second. Can we make sure -- I think we have Miriam and David. Miriam, did you have any questions?

MS. NG: No.

MS. DOUGHERTY: David?

MR. MCGRAW: No.

MS. DOUGHERTY: Okay.

MS. SIHVOLA: Okay. I am going to make this statement as my comment.

"Violence has occurred at this meeting as a result of a Laboratory employee's action in pushing a chair and injuring a member of the audience, who now cannot participate because her back is injured. And she had to leave to go to the hospital. The injury has prevented her from reviewing and making comments during the public comment period as she so desired. Therefore, the meeting should be dismissed as community participation has been interfered with."

MS. DOUGHERTY: I think we are to the point of public comment.

MS. DUFFY: Should we talk about the next meeting before we go to public comment?

MS. PACKARD: Couldn't we go through 6 and 7, just extend a few minutes, and get through 6 and 7?

MS. DUFFY: We can try. Do you want to try that?

MR. MCGRAW: I can give it a shot. You bet.

MS. DOUGHERTY: If we do that -- can I check in with the whole Task Force if we can do that because if we do that we will need to extend public comment after 9:00 o'clock. We will be quite a ways after 9:00 before the public begins to comment. Is that agreed by all Task Force members? Everyone seems okay. Let's try it. Then let's get David up here on Item 6. David McGraw is going to present Item 6 and 7.

MS. SIHVOLA: I think Item 7 should come first.

MS. DUFFY: We are going to do it right in the order.

MS. PACKARD: I would prefer to hear from the Lab so I have their basis, and then we could go from there.

MR. MCGRAW: Quickly, again, I want to remind you so that we get focused, what the structure of the presentations has been for my part of it, and the last three meetings. That is we talk about the media that is sort of at the heading of each slide. And tonight we have talked about ambient air.

I will talk about strictly about groundwater and urinalysis. And in each medium I present three things. I present what was proposed in the original Tritium Sampling and Analysis Plan. I present what the Berkeley Lab does in the ongoing monitoring plan, not the Tritium Sampling and Analysis Plan, the ongoing monitoring plan. And then I address community comments and the Lab's responses. So it can get confusing. That is why I wanted to remind you of that.

So here is the media, groundwater. What was in the Tritium Sampling and Analysis Plan. This is retrospective, not necessarily the situation now. No groundwater sampling was originally included in the plan. EPA feels that it has sufficient information for the Hazard Ranking System

without additional groundwater sampling.

Now, in the ongoing plan, that is not the case. So for the non-TSAP we have got the groundwater very, very well characterized. I think Michael Rochette would agree with that statement. And I think he has very recently documented that agreement. We have an extensive groundwater monitoring program under the ongoing monitoring plan. Currently 56 wells on the site are specifically monitored for tritium. And we can discuss that in our quarterly regulatory meetings. And that is discussed with state regulators, the city, and the Department of Energy also. We have a repository of that information in the library, and you can certainly go to that web site and find it.

Here are the comments. Same medium, we are still on groundwater. Here are Task Force and community comments. This is an EPA comment. It reinforces what I already said. It is not a significant dose pathway. The nearest groundwater within four miles of the site is not currently being used as drinking water. EPA has no intention of using this as a scoring system for HRS.

Other comments on the same issue, groundwater samples, performing groundwater monitoring. Some people felt we should perform groundwater monitoring as suggested by the Regional Water Quality Control Board. Well, again, the

Water Board has recently sent us a letter that says for Superfund scoring purposes, they are satisfied. We don't need to do this as part of the TSAP. They are happy that we have the groundwater well characterized under the ongoing program.

Now, this is an old comment. I think Michael may or may not want to speak to that. He has updated that point of view recently because of the detailed characterization of groundwater under the ongoing program. Bernd did not feel that we would be adding groundwater sampling to the plan. Certainly if EPA asked us specifically to do that, and said we would use it, we would do that. But they don't think they will. And we don't think they will use it. And we do think that that is so well characterized, that now the Board agrees with that.

Okay. So groundwater, we are belaboring this a little bit. So, I think we can go probably through that one. We have already said most of those things. The Board has confirmed that. So, urinalysis. The history came up of our Lab employees. And one of the things we have agreed to do -- it was a comment. It doesn't belong in the Tritium Sampling and Analysis Plan because there is no way to score that for the Hazard Ranking System. And I think the EPA would agree. But the suggestion was, why don't you do urinalysis besides the people that work in the tritium

facility? Why don't you do it on some of your employees?

Well, we will do that. It is not all that simple. You have to put a protocol together, and then put it through our Ethics Committee, our Human Subjects Committee. But we have done that. And, I believe, we just got approval from the Institutional Review Board of Physicians and Scientists this afternoon. Is that right, Gary?

GARY: Yes.

MR. MCGRAW: So, we will now do that. So there will be weekly urine samples. This is the ongoing program. We are required to do occupational sampling, but we will now do urinalysis of other people at the Lab as well. Now that we have the Ethics Committee's approval, we will start that immediately. I think that is just about it for me. So, we can go on to the next agenda item.

MS. DOUGHERTY: Next agenda item is Q and A. And Michael is the first person with his hand up. David, if you could stay available with your mike, so they can ask you questions. Michael, did you have a comment?

MR. ROCHETTE: Well, Dave, I am very impressed. It looks like you have adequately addressed the Water Board's concerns. We have indeed issued a letter this week reclarifying our position. The Water Board is comfortable with the amount of groundwater sampling and monitoring that is going on. And we are not requesting additional

groundwater sampling as part of the Tritium Sampling and Analysis Plan. We feel that for RCRA we have had adequate coverage for the tritium, not only in the area of the NTLF, but upon a closer review, and talking with Iraj, looking at some of the other locations for tritium sampling, that we are comfortable with the assessment that is being done site-wide for the tritium at Lawrence Berkeley National Lab.

The one point of departure, though, is that the Water Board has maintained, and once again would request, that EPA include the groundwater as a drinking water source in the Hazard Ranking System assessment. Basically, that would be one component of an overall assessment of all beneficial uses, or I should say, an assessment under the Hazard Ranking System of all of the beneficial uses impacted by the tritium including groundwater and surface water.

I believe that the surface water sampling that is being carried out under the Tritium Sampling and Analysis Plan should be able to meet that request. And you had addressed our concerns, David. I appreciate that, and I think that we are fairly clear on our understanding. We do have a slight disagreement. And we are hoping that EPA will seriously evaluate our request to include the groundwater as part of the Hazard Ranking System evaluation.

MS. DOUGHERTY: There is another question or comment.

MR. ROCHETTE: I will take questions also. Fran, you talked to me earlier. Do you have a question?

MS. PACKARD: I don't think so. Things can proceed. Let me make sure I understand. Things can proceed as we are going along now. And we can make modifications to this plan if we approve it, but the monitoring will proceed?

MR. ROCHETTE: That is right.

MS. PACKARD: And the EPA can get on with doing the ranking. You are asking additionally that they consider the groundwater be part of the Hazard Ranking System?

MR. ROCHETTE: That is correct.

MS. PACKARD: Okay. But that probably has to go through Washington or something.

MR. ROCHETTE: They have to do all this additional quality control, though it could be performed as part of the Tritium Sampling and Analysis Plan implementation. And then that body of data would be provided to EPA. They would take that body of data and also the RCRA facility investigation groundwater data, and use that body of data together with the Hazard Ranking System to make that evaluation.

MS. PACKARD: You use the current groundwater wells?

MR. ROCHETTE: That's correct.

MS. PACKARD: You don't have to go through the same process --

MR. ROCHETTE: By the time that actually happens we may have a few more rounds of quarterly sampling in.

MR. MCGRAW: We would use the existing program.

MS. PACKARD: Okay. Thank you.

MS. MARKLAND DAY: During the public comment period when you expand the things under the Hazard Ranking System, I would very much like to have an opportunity to comment on whether it should be expanded to include that. Does the public get to comment on that?

MR. ROCHETTE: You would have to ask EPA about that.

MR. BANDROWSKI: On the HRS?

MS. MARKLAND DAY: Not the HRS itself, on including things that are not normally included in HRS.

MR. BANDROWSKI: Not a public comment, but you can certainly provide your comments to EPA. What I was going to suggest for Michael is if you could put the data in your request in writing to Philip or Betsy in Superfund, I am sure they would evaluate it.

MS. DUFFY: Paul, did you have something on this?

MR. LAVELY: I wanted to mention that part of what you are talking about, Dave, was the urine samples. We have had a program for doing urine samples for the Lawrence Hall of Science staff. And we are also looking at continuing and formalizing that program. Because up until now it has been informal. And we really couldn't publish or use the results because we couldn't go through all of the steps for human use authorization that you and I are now both going through.

But we do plan to do a similar study to formalize the ongoing program that we have had for the Lawrence Hall of Science, so we could actually publish and use the data.

MS. DUFFY: Do you need an address to write to?

MS. MARKLAND DAY: No. I think what it takes is the request to EPA. So that would be the first thing.

MS. DUFFY: So Michael could send you a copy of his letter possibly.

MR. AL-HADITHY: The City of Berkeley went through this process months ago as to whether or not to consider groundwater as a potential water source for inclusion in the Hazard Ranking System. The reason why the city is interested in this is because there have been inquiries from the City Council and from the public for more use of groundwater than is currently the case. As you know, over the past century the number of groundwater wells -- shallow

groundwater wells -- has declined from about 250 wells in Berkeley to maybe about half a dozen at the moment.

We anticipate water shortages could be such that we might start using shallow groundwater more regularly. And that is the reason that the City of Berkeley is also interested in this discussion. However, we have not really put our weight behind the HRS because that is something we left to USEPA. But in terms of the arguments behind Regional Water Board's request, it is based upon a real need from the City of Berkeley.

MR. MCGRAW: Could I respond to that, Nabil? I think that your concerns are legitimate concerns that a municipality has. But keep in mind that the groundwater at the Laboratory is not a potential drinking water source even if there was a dire shortage of water. And the hydrogeology of the Laboratory is very complex. The flow rates are so low that you would not get a legitimate drinking water well, even if you drilled on site. Let's keep that piece in mind.

MR. AL-HADITHY: Yes, I would agree with you. Most of the formations on the Laboratory are not of the type that would yield sufficient water, but certainly there is a lot of fill. There are a lot of areas on Lawrence Berkeley which are more recent and undifferentiated materials that would actually yield a substantial amount of

water.

MS. DOUGHERTY: Thank you. We are now at a point for the Task Force members. We are at five minutes until 9:00. It is time for public comment. Pamela, I see you. I want to acknowledge that. It is time for public comment at this point in time.

David, did you have a closing statement about where we are, or what you would like from the Task Force at this point?

MR. MCGRAW: Well, I think where we are is that we are ready to proceed with sampling very, very shortly. And certainly we have got approval to do that from DOE, in EPA, and several media. We have presented other media tonight. We would like to give a hiatus of about a week and wait for comments on those media, but then proceed. We will consider those comments, if they are submitted, and then proceed with sampling.

So, it is our plan to start to sample fairly quickly, in April if possible. And then do that for the next year.

MS. DOUGHERTY: Did you want to respond to Pamela? Otherwise, my tendency would be to go to public comments

MR. MCGRAW: Let's go to public comments.

MS. SIHVOLA: I would like to get the verification of the NTLF operations discussed at this time, since the sampling is contingent on the verification that the NTLF

is, in fact, operating.

MS. DUFFY: She wants to know about the operation levels at the NTLF.

MR. MCGRAW: Pamela just got a letter from me that clarified all those questions.

MS. SIHVOLA: No, I would like you to provide that information for all the Task Force members because --

MS. DUFFY: They all got a copy.

MS. SIHVOLA: The letter states you are not going to provide dates for tritiations, which we had requested.

MR. MCGRAW: I am not going to do that.

MS. SIHVOLA: So you had a president in this country who said, "Trust but verify." I think you are obligated to provide us the verification we are requesting if you think that this process is going to be considered at all.

MR. MCGRAW: Dr. Williams came up and presented his bit on tritiations. The Task Force can judge from that whether we have answered that question or not.

MS. DUFFY: He answered the question in the packet. So, let's let the Task Force members read it because they just got it tonight.

MR. ROCHETTE: Is that the March 28th letter?

MR. MCGRAW: Yes.

MS. DUFFY: So that would be good, if people could

read that and then send comments to Ginny Lackner -- this is Ginny over here.

MS. DOUGHERTY: And Jeanne Gerstle has pulled cards, I believe, from the public.

MR. MCGRAW: Let me say one other thing before we finish -- or Ginny will not be very happy with me -- if we proceed -- when we proceed with the sampling, if you would like to observe or join us for sampling, the person who is going to coordinate that is Ginny. We can only accommodate so many people at a time. We have to get you signed in to the facility. But the person who has graciously agreed to coordinate that is Ginny Lackner. And she gave me her phone number at the Lab earlier tonight. And so if you want to participate in that, you need to coordinate it through Ginny, through 486-7413.

MS. LACKNER: 486-7413. She will coordinate the logistics and particulars around people observing the sampling. Should they call soon, Ginny? It is one point of contact.

MR. MCGRAW: First come, first serve deal.

MS. DUFFY: We are going to begin sampling soon.

MS. LACKNER: Next week.

MS. DOUGHERTY: I am sorry, Pamela. We need to go on to public comment.

MS. SIHVOLA: I have a request. I wanted to pass

this out. Regarding the presentation by Owen Hoffman, we would like to have the Laboratory provide us the input files that were used in the running of the models --

MS. DOUGHERTY: You can pass out anything you like, but it is real important that we move on to public comment.

MS. DOUGHERTY: Jeanne, would you read the names? Thank you, Task Force members. We appreciate all of your hard work and dedication to this process.

MS. GERSTLE: Stephanie Van Zandt Nelson and L.A. Wood.

MS. VAN ZANDT: Hi. My name is Dr. Stephanie Van Zandt Nelson. As people know, my father was the director of the Manhattan Project part that found the uranium. I wanted to say that after the last meeting last month I went onto the Nevada Test Site where the environmentalists were trying to talk to Nevada test site about sampling over there. The environmentalists wanted the wells put where the radiation was coming. But the Nevada test site said, "Well, we don't want to put the wells there. We want to put them far away over here."

I said, "This is very interesting. It reminds me of what is happening at Berkeley." I urge you, why not do what Pam said? Why not do what Pam said? Why not sample more? Remember it is children. It is the fetus. It is

all of us. Why not do more? Why are you resisting?

Also, I have a blessing of the water, a Radioactivity in the Bay Conference, I am going to put out here for people. Corbin Harney, Western Shoshono Medicine will be leading a ceremony on May 6. And then we will have a conference, Radioactivity in the Bay, History and Location 1920s to 2001. You are all welcome to come. It will be at Aquatic Park in San Francisco on May 6th.

Come on. Let's hear what the truth is. Remember babies are involved. Why not do what Pam says? What are you afraid of? We must find out what America did wrong. The scientists said it was a wonderful thing, radioactivity, but it was a poison. And now we have the legacy to clear up. Thank you.

MS. DUFFY: Thank you. I see someone filling out a card. Are there other cards?

MR. WOOD: I am going to make a very, very short statement. Pamela Sihvola tried to ask you a moment ago for the output data for the wind study. What I am here to suggest to you is last week on the City Council agenda there was an item on sunshine. And I think that if you want this process to be honest, and you want us to take faith in it, and be involved in it, then you need to sunshine all these documents. And even those that you would think we may not understand.

I would ask for the wind data. And I would ask publicly that Mr. McGraw would provide us with the tritiation data that we asked for, so that we can look into this discussion. Otherwise, if we only have half the picture, we can only fabricate the rest. We would like to have the data, and it is critical.

Finally, I want to thank the Regional Water Board representative here tonight. For almost a decade I have fought for the salvation and the beneficial use of Berkeley's groundwater, and the cleanup of its groundwater. And I know the City has some very ambitious future plans for identifying and using groundwater. And, as I said, I want to salute the Regional Water Board for bringing up a very, very critical issue, at least to me, if not to all the members of the Task Force.

MS. DUFFY: One more person, Jeanne.

MS. GERSTLE: Lauren Moret.

MS. MORET: Good evening. I would like to address the letter by Marion Fulk, which I read on January 17th to the Task Force. He provided three methods to assess the health risks and damage due to exposure to tritium or radioactive hydrogen. One of them was chromosome painting -- and I have the references here -- which is a sensitive technique developed at the Lawrence Livermore Lab.

"The historic mission of the biology and biotechnology

research program at the Livermore Lab is to identify and characterize adverse health affects resulting from energy use and development, including induced, inheritable genetic changes, and defined ways to prevent or ameliorate them. Research on methods to advance our understanding of the structure of mammalian chromosomes and to assess associated genetic defects have been on going at the Laboratory for three decades."

That was in 1992. "Chromosome painting is a quick and accurate way to determine chromosome damage and to assess the stability of aberrations over time. Therefore, increased exposure or radiation dose results in increased damage. This method was used to verify dosimetry techniques by measuring the amount of damage years after exposure, and comparing it to the measured exposure reported from dosimetry monitoring at the time of exposure. It was also used in a 33-year old worker at the Livermore Lab, who in 1985 accidentally drank tritiated water. By using chromosome painting the exposure damage was measured with 60 times the normal amount of chromosomal translocations. The damage persisted unchanged six years after the first study."

I am not going to read all of this, but I will submit it to the committee. In a newspaper article from the Las Vegas Sun, January 4, 1999, "Tritium Stirs Concern at Test

Site. Scientists call elements more worrisome than plutonium." Their concern is how fast and how far tritium has traveled in the groundwater, and whether it has escaped the site's boundaries. Tritium is considered the most dangerous of the materials left over from the nuclear blast because it dissolves easily in groundwater and poses a threat to public health for more than 100 years.

My question to the Task Force is, based on the damage measured in the LLNL worker who drank tritium, and the fact that the DOE considers tritium to be a more serious threat than plutonium at the Test Site, how can the Task Force, LBNL, UCB, and Gordon Wozniak continue to discontinue, minimalize, and trivialize the dangers to health in the community? The visitors to the Lawrence Hall of Science, the children, and the pregnant women exposed daily to tritium documented in organic material and goat droppings collected --

MS. DUFFY: You need to finish, please.

MS. MORET: -- at LBNL from a 1996 study as well as water and air samples. These methods have determined that tritium is a health hazard in other studies and is certainly a health hazard at UC and LBNL. The reluctance of LBNL --

MS. DUFFY: Are you almost done?

MS. MORET: -- to address this issue leaves no

alternative, but to close down the National Tritium Labelling Facility. Thank you.

MS. DUFFY: Thank you very much you guys.

(Meeting concluded 9:10 p.m.)